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ABSTRACT

Since the 1980s, enterprises have experienced massive organizational changes influenced by introduction of and rapid advancements in new technologies, new organizational structures, and new organizational management methods. From Becker's theory of a sequential relationship between education and training to competence in knowledge and skills to productivity and earnings, formal and informal education and training are becoming an intrinsic feature of ongoing technological and organizational change in many enterprises. In addition to workplace human resource development, enterprises are looking for new knowledge and skills in entry-level employees. Amid these educational and training challenges, many enterprises are developing learning environments and striving for continual improvement intrinsic to the learning organization. Implications of the learning organization for the enterprise are as follows: it promotes a strategy for continual improvement in quality of thinking, capacity for reflection and team learning, and ability to develop a shared vision and understanding of complex industry issues. Other Western enterprises have adapted Japanese methods, such as just-in-time production. National lifelong learning initiatives may actually be training policies intended to improve economies. Since postsecondary institutions are in a position to meet training needs of the rapidly changing workplace, education and training policy should encourage close connections between institutions and enterprises. (Contains 24 references.) (YLB)

Changing Paradigms in the Industrial Workplace — Implications for Secondary and Post-secondary Institutions

by

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Abstract

This paper analyzes the significant changes occurring in the workplace; whereas, enterprises are endeavoring to convert their organizations from the hierarchical structure of the past to a more horizontal design that fosters worker participation, decision-making, teamwork, and lifelong learning. Exploring the metaphoric learning organization and lifelong learning philosophies, this paper discusses the influences from new technologies, management philosophies, and global competition to illuminate new challenges and expectations for industry leaders, government policymakers and educational institutions.

This paper was presented at the 15th Annual Association of Management and International Association of Management International Conference in Montreal August 6-9, 1997.

Introduction

Contemporary Western industrial enterprises have undergone considerable change as compared to those of the 1950s and 1960s. Responding to rapid technological growth and increased global competition, enterprises have restructured their organizations from the Taylorist model to examples exhibiting workplace environments that foster worker participation, decision-making, teamwork, and learning. This paper will examine these changes in the industrial workplace. In particular, this paper will analyze these changes and implications for knowledge and skills development for workers. In addition, this paper will explicate formal and informal learning, the concept of the 'learning organization', and how the learning organization relates to the enterprise. From these new workplace paradigms, this paper will argue the need for worker skill development vis-à-vis secondary and post-secondary institutions.

Change in the Industrial Enterprise

For much of this century Frederick Taylor's *Scientific Management* (referred to as *Taylorist* or *Fordist Management*) dominated Western industry. In these capitalist economies, the enterprise relied on the massive ranks of middle management to process the flow of information up and down the corporate hierarchy and to supervise a low educated low-skilled workforce (Rifkin, 1995). As a result of scientific management, managers controlled work organization, productivity increased in the factories, and the workforce entered a realm of mechanized work. In the mechanized workplace, people labored with repetitive motion and required few cognitive skills (Morgan, 1986).

In the second half of the twentieth century, particularly since the 1980s, the enterprise experienced massive organizational changes, from the archetypical, vertical, hierarchical, and

pyramidal structures with specifically defined job tasks to organizational structures that provide broader job classifications and skills (Hasan, 1994, p. 13). These post-taylorist organizations employ concepts such as decentralization, multiplication of profit centers, lean production and lean management, team work, and production islands. In these new workplace cultures, enterprises are amending their management practices to support formal and informal learning processes intrinsic to organizational learning (Marsick & Watkins, 1990, Lutz, 1994; OECD, 1989a, 1989b; Marsick 1987).

There is evidence that several conditions have influenced these widespread changes in industry. The three predominate factors contributing to this new post-taylorist workplace are the introduction of and rapid advancements in new technologies in the workplace, new organizational structures, and new organizational management methods (Rubenson & Schütze, 1994). "New technologies can serve as catalyst for organizational change, including work reorganization and retraining" (Chaykowski & Lewis, 1994, p. 16). OECD (1989b) reports that technological innovation is one of the dominating influences for structural change. Indeed, the advent of computer numeral controlled (CNC) robotics has revolutionized the manufacturing processes over the last two decades.

Although these advances are formidable and have removed much of the manual labor from the industrial manufacturing enterprise, there is substantial empirical data linking these innovative technologies to unemployment or under-employment in modernized nations. From his review of the decline in the American blue-collar workforce (specifically, the U.S. steel and automobile industries), Rifkin (1995) suggests that the future factory may require very few employees and that the future economy may not be able to absorb high numbers of low-skilled workers, as did industrial economy in the past.

The second factor influencing change in organizational structure emanates primarily from global competition and the basic capitalist imperative for high profits. Awareness of global competition came about in the 1980s, after the Japanese automobile manufacturers successfully increased their percentage of sales in the U.S. market, while the powerful American automotive industry continued to employ *Taylorist* organizational methods. Due to this loss in market share to the Japanese, the American automotive industry investigated the organizational structure of the Japanese enterprise (Nonaka & Takeuchi, 1995; Rifkin, 1995; Morgan, 1986).

In response to the new global competition, Western enterprises explored ways to restructure and strengthen their organizations by implementing the Japanese (*post-taylorist* or *post-fordist*) models of operator responsibility for quality, continuous improvement, quality circles, statistical process control, design for manufacture, set-up time reductions, just-in-time production, total quality control, cellular manufacture, and *kanban* materials control (Marsick & Watkins, 1996; Cappelli & Rogovsky, 1994; Oliver & Wilkinson, 1992; Munnelly, 1987; Morgan, 1986; and others).

However, Western enterprises have found that using the Japanese organizational template requires modification to address the cultural differences between the ancient Japanese *samurai* culture and Western individualism perspectives (Nonaka & Takeuchi, 1995). The diversity of Western culture has led to different adaptations for restructuring the workplace. Employee participation is paramount as companies restructure their organizations and implement post-taylorist methodologies. Munnelly (1987) explored this in a study of several enterprises in the U.S. that experienced negative effects when implementing post-taylorist programs without employee participation.

The final factor, as Munnelly discovered, concerns employee participation as pivotal to the post-taylorist organizational management methodology. Taylor's (1916) scientific management model prospered in Western enterprises due to the lack of education and skills in the workforce. Indeed, as economies addressed human capital for national prosperity, modernized nations have developed education and training strategies for their populations. However, Rumberger (1981) found that when over-educated workers have mechanistic jobs and work below their ability, high levels of job dissatisfaction may lead to deterioration of mental and physical health, turnover, absenteeism, strike activity, drug problems, industrial sabotage and ultimately lower productivity.

The new post-taylorist workplace that fosters employee participation, team-work, and increased employee autonomy requires an educated workforce with reasoning and problem-solving skills. These needs for higher educated workers in the new workplace, coupled with the evolution of an over-educated workforce dissatisfied with the Taylorist organization, has provided impetus for organizational change.

Knowledge and Skill Requirements in the Workplace

In the new post-taylorist workplace that fosters continuous improvement and teamwork, enterprises need employees that possess cognitive, technical, and interpersonal knowledge and skills. Hasan (1994) discussed the direct relationship between increased skills and competence and the performance of the enterprise. Becker (1993) and other human capital theorists developed a sequential relationship between education and training to competence in knowledge and skills to productivity and earnings.

Education ⇒ Growth of Potential ⇒ Productivity ⇒ Earnings

From this sequential relationship of education and training to productivity, formal and informal education and training are becoming an intrinsic feature of ongoing technological and organizational change in many enterprises. In addition to workplace human resource development, enterprises are looking for new knowledge and skills in their entry-level employees. The U.S. Department of Labor released a report that urged America's K-12 schools to emphasize 1) basic skills – reading, writing, arithmetic and mathematics, speaking and listening, 2) thinking skills – the ability to learn, to reason, to think creatively, to make decisions, and to solve problems, and 3) personal qualities – individual responsibility, self esteem, self management, sociability, and integrity (Secretary's Commission on Achieving Necessary Skills, 1992).

One critical result of rapid technological changes and pre-employment training emanates from the demand for the high-skilled workers from the available high-skilled persons who possess the wrong skills. The massive unemployment problem in many developed economies was partially due to a 'skills mismatch' of 'low-educated, low-skilled' workers and mis-skilled workers, such as young university graduates (Carnoy & Fluitman, 1995). Most modernized economies have found an under-skilled labor force vis-à-vis the economy's changing skill demands (Carnoy & Fluitman, 1995; Carnevale, 1991).

These suppositions question the significance of secondary or post-secondary education and training, and support education and training in the workplace. This leaves questions relating as to what levels economies should invest in pre-employment education and to what levels governments should support enterprises with training to reduce unemployment from the skills miss-match. Amidst these education and training challenges, many post-taylorist enterprises are developing learning environments and striving for continual improvement intrinsic to the learning organization.

The Learning Organization

The enterprise of the past predominately adhered to Taylorist concepts such as (colloquially expressed) *checking your brains at the door* (Morgan, 1986). In contrast, in the post-taylorist organization, enterprises support the participation of workers through teamwork, decision making, and the sharing of knowledge. "There is a close resemblance between the principles for humanization of work and the principles for effective learning. The latter can be both a result of organizational change and an instrument for such change" (Rubenson & Schütze, 1994, p. 115).

Observers of the evolution to post-taylorist organizational structure have noted changes in managerial culture that require holistic systems thinking, continuous learning and improvement, shared knowledge and purpose, employee and work team autonomy over their jobs, and collective participation in decision making. Promoters of this new organizational management culture refer to it as the *learning organization*.

Marsick & Watkins (1996) define the *learning organization* as an organization that draws from the collective intellect, continually learning and growing. Individuals learning in an organization do not necessarily constitute a learning organization; a *learning organization* involves aggregated learning. Thus, the *learning organization* advocates formal and informal learning through teams and groups that provide individuals with opportunities to share lessons and work together to mutually learn from new knowledge.

The concept of the *learning organization* provides the groundwork for a major shift as enterprises move from Taylorist organizational structures to the post-taylorist workplace. These aggregated learning approaches may enhance continual improvement for the enterprise and individuals within the organization.

As Marsick (1987) contends, learning for organizational efficiency must be synonymous with individual learning in the company. Organizations should not leave the responsibility of learning to the individual isolated from the work place. Rubenson & Schütze (1994) report from Swedish experiments "that an effective way to organize learning at work is to organize work at all levels in such a way that all employees participate in the management process of the part of the operation in which they actually work" (p. 114).

The implications of the *learning organization* for the enterprise is exemplary. It promotes a strategy for continual improvement in quality of thinking, capacity for reflection and team learning, and ability to develop a shared vision and shared understanding of complex industry issues (Senge, 1990). However, there is a potential for the capitalist enterprise in pursuit of profits to only partially embrace the *learning organization* strategy, such as promoting a "shared" vision, though only shared by top management. Such actions may exploit workers and, in effect, retain the characteristics of the Taylorist organization.

While many Western enterprises have evolved into learning organizations and used new innovative methods to enhance individual and enterprise growth and competitiveness, others have adapted Japanese methods in ways that may only provide short term profits. Some of these schemes to increase profits suggest worker exploitation (i.e., the adaptation of the Japanese just-in-time inventory methodology to a just-in-time labor force). Such schemes may have positive effects for enterprises in the short term; however, they may have negative effects for enterprises in the long term. These negative effects may include a lack of trained workers, lower productivity, and increased social problems from unemployment and under-employment.

Just-in-Time Workforce

As Western enterprises studied the Japanese industry, they formulate methods to implement such strategies in their organizations. The Japanese Just-in-Time (JIT) production strategy is a holistic approach vis-à-vis inventory and the manufacturing process. Utilizing JIT production systems, Japanese manufacturers organize the complete inventory process with the production process to eliminate surplus inventories and industrial floor space. As a result of this strategy, all parts and sub-assemblies arrive on the manufacturing floor just in time for assembly (Oliver & Wilkinson, 1992).

Many Western enterprises adapted the JIT inventory into their organization. This adaptation did not involve the enterprises' inventory stores; moreover, it involved temporary workers. In implementing this strategy, some enterprises terminated thousands of employees and re-hired from a new reserve army of under-employed temporary and part-time workers.

In America, part time and temporary contingent workers currently comprise 25% of the workforce. By 1993, 34 million workers were contingent temporary workers. Manpower, America's largest employer, is a temporary agency that contracts to supply enterprises with temporary workers and now employs over 560,000 workers. These workers earn 20% to 40% less than full-time workers doing comparable work. Less than 25% of these temporary workers receive health coverage, as compared to 88% of permanent employees (Rifkin, 1995).

The JIT reserve workforce is not peculiar to America. European enterprises have also implemented JIT part-time workforce strategies. The United Kingdom, has nearly 40% contingent and part-time workers, the Netherlands has 33%, Spain has over 33%, and Norway has 20% (Rifkin, 1995).

OECD (1989a) cautions that long term problems may occur from the lack of willingness and ability of enterprises to provide substantial training for this contingent workforce. Particularly in the U.S., enterprises expect that JIT workers train themselves to occupy the rapidly changing positions in the workplace (Carnoy & Fluitman, 1995; Lutz, 1994).

This Western adaptation of the Japanese JIT inventory system to a JIT workforce system parallels the *Machine Metaphor* of Taylor's scientific management. As a result of scientific management, human beings entered a realm of mechanized work in which they labored like machines with repetitive motion (Morgan, 1986). The JIT workforce presupposes that workers are available at the door when needed the same as the JIT parts arrive on the factory floor when needed. Although this strategy may bring increased profits and global competitiveness for the capitalist enterprise, it suggests exploitation of the worker and may have long term negative effects. These long term effects may result in:

- lack of benefits vis-à-vis health insurance, sick leave, and retirement pensions for JIT workers,
- poor motivation and attitudes of contingent workers and the subsequent effect on production,
- lack of training for JIT workers, resulting in a shortage of skilled workers,
- stratification of the blue collar workforce, leading to a new class of under-employed working poor, and
- the inability of the under-employed to purchase consumer goods, which will impact modernized economies.

Thus, to prepare for the effects of the JIT strategy, nations will need to either address these issues with labor legislation or develop education, training, and social health and pension programs.

Lifelong learning

Nations are addressing methods to enhance lifelong learning for their workforce. Lifelong learning perspectives evolved from the recurrent education philosophy and are "now understood to mean the continuation of conscious learning throughout the life-span, as opposed to the idea that education stops at 16, 18 or 21" (OECD, 1996, p. 89).

OECD (1996) reports that the prevalent interpretation of lifelong learning accepts that learning is not limited only to educational institutions and that it encompasses the intrinsic importance of learning, common aspiration for universal access to learning opportunities, importance of informal learning in diverse settings, diversity in learning styles, motivation and potential of learners to engage in self-paced independent learning, and that life long learning is an alternative to 'front-end' pre-employment education.

Economies are exploring national roles for enhancing lifelong learning. These include institutionalized opportunities, support for community based organizations, grants and funding for individuals, workplace training strategies, and educational leave schemes. Schütze & Istance (1987) report that several western European countries have education leave laws or negotiated labor schemes that allow employees to leave their jobs to pursue vocational and/or general education.

It is difficult for nations to establish policy regarding non-formal education. However, the concept of lifelong learning infers continual learning, whether formal or informal, from life, school, or work experiences. Consequently, lifelong learning initiatives may actually be training policy to improve economies. Though such initiatives are admirable, the OECD report (1989a) on lack of participation in some of the European countries, regarding right to leave work and

pursue continuing education initiatives, suggests that inspiring lifelong learning for continual improvement desires in the populus will involve complex innovative strategies.

One such lifelong learning strategy may include Nations promoting new workplace cultures where enterprises foster a learning environment; whereas, other strategies may include access and new opportunities for adults in educational institutions.

Implications for Education and Training Institutions

At the rapid rate of technological advances and changes in the workplace, secondary and post-secondary education and training institutions should emphasize preparatory training in general and specific reusable skills, particularly the ability to adapt and learn, problem solve, and quickly adjust to change (Carnoy & Fluitman, 1995; Rubenson & Schütze, 1994). In contrast, if education and training institutions provide narrowly focused technological training, they may be, in effect, preparing workers with a skills mis-match; whereas, if they provide a general education and training emphasizing interpersonal skills along with lifelong learning skills, the workers will have higher marketable qualifications.

With the growth of the JIT contingent workforce, educational policy should provide for growing needs in retraining for new technologies and assure that all workers have access to computer and technical literacy training. Educational institutions are in a position to provide such training and to support economies as they confront a growing temporary workforce that no longer has employable skills.

Lutz (1994), and Rubenson and Schütze (1994) suggest that to meet the training needs of the rapidly changing workplace, education and training policy should encourage close connections between post-secondary institutions and enterprises. Through developing these linkages between

post-secondary institutions and industry, educational institutions can provide programs that combine general theoretical learning with workplace-specific content.

Hence, secondary and post-secondary education and training institutions are in a paramount position to provide the necessary knowledge and skill requirements in the changing workplace. However, it is critical that educational institutions respond quickly to the changing paradigms in the workplace. Educational institutions will need to:

- provide a general preparatory education for entry into the workplace that includes lifelong learning, problem solving, and interpersonal skills,
- develop close linkages with industry and to know when changes are occuring,
- promptly respond to new knowledge and skills training needs, and
- provide access to knowledge and skills training for adults at all stages of their careers.

Conclusion

The advent of technological advances, the competitive global market, and workforce demands for participation and humanistic management have prompted substantial change in the workplace. As enterprises have attempted to restructure their organizations, technology and national cultures have influenced the methods of new change initiatives. Enterprises have restructured from the Tayloristic organization to post-taylorist organizations that have adapted Japanese methods for continual improvement. The adaptation of these methods, whether holistically (such as the learning organization) or superficially (such as enterprises using new strategies to exploit workers), has led to new challenges for developed economies. It is certain that as we enter the twenty-first century, enterprises will continue to experience major changes.

These changes will result in new challenges and issues for economies vis-à-vis social health and pension programs and new implications and expectations for educational institutions.

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